CURRICULUM VITAE
Katrina M. Groth

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Research Interests

- Causal modeling, decision making under uncertainty, influence diagrams, Bayesian Networks, Probabilistic Risk Assessment, Human Reliability Analysis, Fault Trees, Event Sequence Diagrams, Accident Sequence Precursors, nuclear power, hydrogen fuel cells,

Professional Experience

- **Senior R&D Engineer – Nuclear Engineering**, June 2010 - present
  Risk and Reliability Analysis Department
  Sandia National Laboratories, Albuquerque, NM

- **Postdoctoral Researcher**, January 2010 - June 2010
  Department of Reliability Engineering
  University of Maryland, College Park, MD

- **Graduate Research Assistant**, August 2004 - December 2009
  Department of Reliability Engineering
  University of Maryland, College Park, MD

- **Visiting Academic Researcher**, January - August 2008
  Human Factors & Instrumentation and Controls Department
  Idaho National Laboratory, Idaho Falls, ID

- **Research Intern**, June 2003 - July 2004
  Fire Research Division
  National Institute of Standards and Technology, Gaithersburg, MD

- **Undergraduate Research Assistant**, June 2002 - May 2003
  Department of Chemical Engineering
  University of Maryland, College Park, MD

- **Student Engineer**, Summer 2001, Winter 2001
  Code/Model Development Team
  United States Nuclear Regulatory Commission, Rockville, MD

Education

- Ph.D., Reliability Engineering, University of Maryland, College Park, 2009
  Dissertation: *A Data-Informed Model of Performance Shaping Factors for Use in Human Reliability Analysis*.
  Advisor: Professor Ali Mosleh. Graduate GPA: 3.8

- M.S., Reliability Engineering, University of Maryland, College Park, 2008

- B.S., Engineering – Nuclear, University of Maryland, College Park, 2004

Refereed Journal Articles

[J6] Jeffrey L. LaChance, Bobby Middleton, and Katrina M. Groth. Comparison of NFPA and ISO approaches for evaluating separation distances. *International Journal of Hydrogen Energy*, 0(0):0–0, In Press 2012. DOI:10.1016/j.ijhydene.2012.05.144

[J5] Katrina M. Groth and Ali Mosleh. A data-informed PIF hierarchy for model-based human reliability analysis. *Submitted to Reliability Engineering & System Safety*, 0:0–0, (In Press 2012).

[J4] Katrina M. Groth and Ali Mosleh. Deriving causal Bayesian networks from human reliability analysis data: A methodology and example model. *Proceedings of the Institution of Mechanical Engineers, Part O: Journal of Risk and Reliability*, 226:361–379, August 2012. DOI:10.1177/1748006X11428107

[J3] Katrina Groth, Chengdong Wang, and Ali Mosleh. Hybrid causal methodology and software platform for probabilistic risk assessment and safety monitoring of socio-technical systems. *Reliability Engineering & System Safety*, 95(12):1276–1285, 2010. DOI:10.1016/j.ress.2010.06.005

[J2] Takashi Kashiwagi, Fangming Du, Karen I. Winey, Katrina M. Groth, John R. Shields, Severine P. Bellayer, Hansoo Kim, and Jack F. Douglas. Flammability properties of polymer nanocomposites with single-walled carbon nanotubes: effects of nanotube dispersion and concentration. *Polymer*, 46(2):471–481, January 2005. DOI:10.1016/j.polymer.2004.10.087

[J1] Takashi Kashiwagi, Eric Grulke, Jenny Hilding, Katrina Groth, Richard Harris, Kathryn Butler, John Shields, Semen Kharchenko, and Jack Douglas. Thermal and flammability properties of polypropylene/carbon nanotube nanocomposites. *Polymer*, 45(12):4227–4239, May 2004. DOI:10.1016/j.polymer.2004.03.088

Refereed Conference and Workshop Proceedings

[C14] Katrina M. Groth and Laura P. Swiler. Use of a SPAR-H Bayesian network for predicting human error probabilities with missing observations. In *Proceedings of the International Conference on Probabilistic Safety Assessment and Management (PSAM 11)*, Helsinki, Finland, 25–29 June 2012.

[C13] Katrina M. Groth, Song-Hua Shen, Johanna Oxstrand, Ali Mosleh, and Dana Kelly. A model-based approach to HRA: Example application and quantitative analysis. In *Proceedings of the International Conference on Probabilistic Safety Assessment and Management (PSAM 11)*, Helsinki, Finland, 25–29 June 2012.

[C12] Johanna Oxstrand, Dana L. Kelly, Song-Hua Shen, Ali Mosleh, and Katrina M. Groth. A model-based approach to HRA: Qualitative analysis methodology. In *Proceedings of the International Conference on Probabilistic Safety Assessment and Management (PSAM 11)*, Helsinki, Finland, 25–29 June 2012.

[C11] Ali Mosleh, Song-Hua Shen, Dana L. Kelly, Johanna H. Oxstrand, and Katrina Groth. A model-based human reliability analysis methodology. In *Proceedings of the International Conference on Probabilistic Safety Assessment and Management (PSAM 11)*, Helsinki, Finland, 25–29 June 2012.

[C10] J. L. LaChance, B. Middleton, and K. M. Groth. Comparison of NFPA and ISO approaches for evaluating separation distances. In *Proceedings of the International Conference on Hydrogen Safety (ICHS 2011)*, San Francisco, CA, 12–14 September 2011.

[C9] Katrina Groth and Ali Mosleh. Development and use of a Bayesian network to estimate human error probability. In *Proceedings of the ANS International Topical Meeting on Probabilistic Safety Assessment and Analysis (PSA 2011)*, Wilmington, NC, March 13–17 2011. American Nuclear Society.

[C8] Gareth W. Parry, John A. Forester, Katrina Groth, Stacey Hendrickson, Stuart Lewis, and Erasmia Lois. Towards an improved HRA quantification model. In *Proceedings of the ANS International Topical Meeting on Probabilistic Safety Assessment and Analysis (PSA 2011)*, Wilmington, NC, March 13–17 2011. American Nuclear Society.

[C7] Katrina Groth and Ali Mosleh. A performance shaping factors causal model for nuclear power plant human reliability analysis. In *Proceedings of the International Conference on Probabilistic Safety Assessment and Management (PSAM 10)*, Seattle, WA, June 7–11 2010.

[C6] K. M. Groth and A. Mosleh. A data-informed model of performance shaping factors and their interdependencies for use in human reliability analysis. In *Proceedings of the European Society for Reliability Annual Meeting (ESREL 2009)*, Prague, September 2009.

[C5] Katrina Groth and Ali Mosleh. Data-driven modeling of dependencies among influencing factors in human-machine interactions. In *Proceedings of the ANS International Topical Meeting on Probabilistic Safety Assessment and Analysis (PSA 2008)*, Knoxville, Tennessee, September 7–11 2008. American Nuclear Society.

[C4] Katrina Groth, Dongfeng Zhu, and Ali Mosleh. Hybrid methodology and software platform for probabilistic risk assessment. In *Proceedings of the Annual Reliability and Maintainability Symposium (RAMS 2008)*, Las Vegas, NV, January 2008. DOI:10.1109/RAMS.2008.4925831

[C3] K. M. Groth, C. Wang, D. Zhu, and A. Mosleh. Methodology and software platform for multi-layer causal modeling. In *Proceedings of the European Society for Reliability Annual Meeting (ESREL 2008)*, Valencia, Spain, September 2008.

[C2] Alfred Roelen, Rombout Wever, Ali Mosleh, and Katrina Groth. Development and validation of a comprehensive hybrid causal model for safety assessment and management of aviation systems. In Enrico Zio, Vincent Ho, and Tsu-Mu Kao, editors, *Proceedings of the International Conference on Probabilistic Safety Assessment and Management (PSAM 9)*, Hong Kong, May 2008.

[C1] Dongfeng Zhu, Chengdong Wang, Katrina Groth, and Ali Mosleh. A PRA software platform for hybrid causal logic risk models. In Enrico Zio, Vincent Ho, and Tsu-Mu Kao, editors, *Proceedings of the International Conference on Probabilistic Safety Assessment and Management (PSAM 9)*, Hong Kong, May 2008.

Technical Reports and Other Papers

[T4] A. Mosleh, K. Groth, R. Kazemi, and Z. Mohaghegh. Peer review of causal model of air transport system (CATS). Technical report, University of Maryland, Center for Risk and Reliability, October 2008. Performed for The Aviation Safety and Security Program, The Netherland Directorate-General for Aviation and Maritime Affairs.

[T3] Katrina Groth. Integrated risk information system (IRIS) user guide. Technical Report CRR-2007SR-014, University of Maryland, Center for Risk and Reliability, July 2007. Prepared for FAA.

[T2] Ali Mosleh and Katrina Groth. Integrated risk methodology: Applications. Technical report, University of Maryland, Center for Risk and Reliability, 2007. Prepared for FAA.

[T1] A. Mosleh, C. Wang, K. Groth, and Z. Mohaghegh. Integrated methodology for identification, classification, and assessment of aviation system risk. Technical report, University of Maryland, Center for Risk and Reliability, March 2005. Prepared for FAA.

Honors and Awards

- George Apostolakis Fellowship Award, International Association for Probabilistic Safety Assessment and Management (IAPSAM), 2012
- Society for Risk Analysis Conference Travel Award, 2009
- Department of Transportation FAA Airworthiness Assurance Outstanding Student of the Year, 2008
- University of Maryland Goldhaber Travel Award for travel expenses related to the European Society for Reliability conference (ESREL), 2008.

- Poster Award (3rd place) University of Maryland Mechanical Engineering Research Review, March 2007
- Idaho National Laboratory Graduate Fellowship, 2006
- A. James Clark Graduate Fellowship, 2004-2007
- American Nuclear Society Washington DC Local Section Award, 2003
- Department of Energy Scholarship, 2003
- American Nuclear Society Scholarship, 2002-2003
- National Academy for Nuclear Training Scholarship, 2001-2003

Software

- Integrated Risk Information System (IRIS/Trilith) – Integrated ESD, FT, BBN software for PRA

Conference & Workshop Presentations

- LDRD Review Day, Sandia National Laboratories, Aug. 14, 2012. *Using limited data to construct Bayesian Networks for Human Reliability* (Poster)
- 19th World Hydrogen Energy Conference (WHEC 2012), Toronto, ON, Canada, Jun. 3–7, 2012. *Risks associated with hydrogen indoor refueling* (Speaker)
- Society for Risk Analysis Annual Meeting (SRA), Baltimore, MD, Dec. 2009 *Development of an interdependent causal model for estimating human error probability from performance shaping factors.* (Speaker and Conference Travel Award Winner)
- University of Maryland Mechanical Engineering Research Review Day, College Park, MD, Mar. 2007. *A model-based framework to integrate safety information into risk management systems.* (Poster)

Seminars

- Statistical Sciences Speaker Series, Los Alamos National Laboratory, Los Alamos, NM, Jun. 20 2012, *Bayesian Networks for Human Reliability Analysis and beyond.*
- Nuclear Energy Research Department Seminar, Sandia National Laboratories, Albuquerque, NM, Mar., 2010, *Bayesian Belief Networks: A way to incorporate risks from human, software, and organizational elements into traditional PRA.*
- Guest lecture, Probabilistic Risk Assessment course (ENRE670), University of Maryland, College Park, MD, Oct. 6, 2008, *Hybrid Causal Logic Methodology and IRIS software platform.*
- Human Factors Department Seminar, Idaho National Laboratory, Idaho Falls, ID, Jan.17, 2008, *Use of Bayesian Methods for Causal Modeling of Performance Shaping Factors in Human-Machine Interactions*

Professional Service and Committee Work

- Conference Organization
  - Technical Program Committee and Special Session Organizer, International Association for Probabilistic Safety and Management (PSAM11/ESREL2012), Helsinki, Finland, Jun. 25-29, 2012
  - Session Chair, International Association for Probabilistic Safety and Management (PSAM10), Seattle, Washington, Jun. 7-11, 2010
  - Marketing Committee, Young Professionals' Congress (YPC), American Nuclear Society Winter Meeting Washington, DC, Nov. 15-16, 2009

- Referee for International Topical Meeting on Nuclear Plant Instrumentation, Control and Human Machine Interface Technologies (NPIC&HMIT 2012) Journal of Hazardous Materials, International Journal of Quality, Statistics, and Reliability,
- Selected Past Committee Work
  - Cataloguer, Tau Beta Pi, University of Maryland, 2004-2005
  - Initiation Committee Chair, Tau Beta Pi, University of Maryland, 2003
  - Vice President, American Nuclear Society University of Maryland Student Section, 2001 - 2003
  - Maryland Day Committee Chair, American Nuclear Society University of Maryland Student Section, 2000

Professional Societies

- Society for Risk Analysis (SRA)
- American Nuclear Society (ANS)
- Institute of Electrical and Electronics Engineers (IEEE) Reliability Society
- Tau Beta Pi